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EXAMINER

BRUCKART, BENJAMIN R

ART UNIT

PAPER NUMBER

2155

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/862,379

Applicant(s)

VENKITARAMAN ET AL.

Examiner

Benjamin R Bruckart

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 May 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-29 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892) *
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 20010522
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

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Detailed Action

Claims 1-29 are pending in this Office Action.

Information Disclosure Statement

The information disclosure statement filed on paper 5/22/2001 has been considered.

Specification

The disclosure is objected to because of the following informalities: Page 1 under Related Applications, there is blank space. This space must be filled in or this section removed.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-4, 6-20, 21-25, 26-29 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 6,006,264 by Colby et al.

Regarding claim 1, a method of operating an edge router (Colby: col. 4, lines 60 – col. 5, line 3), comprising:

receiving a plurality of packets (Colby: col. 4, lines 60 – col. 5, line 3);

determining a flow corresponding to the plurality of packets (Colby: col. 5, lines 52-col. 6, line 6);

determining an incremental utility for each of the packets (Colby: col. 6, lines 42-63; col. 9, lines 1-20; QoS class, priorities and requirements);

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labeling each of the packets with a label as a function of the incremental utility (Colby: col. 8, lines 34-55; labeling by content records); and

processing each of the packets based on the label (Colby: col. 8, lines 34-55; passed to the server).

Regarding claim 2, the method of claim 1, wherein the step of determining the incremental utility includes:

obtaining a utility function corresponding to the flow (Colby: col. 6, lines 42-63; content rules);

determining an intra-flow priority corresponding to each of the packets (Colby: col. 11, lines 19-30); and

determining the incremental utility based on the utility function and the intra-flow priority (Colby: col. 6, lines 42-63; content rules; col. 11, lines 19-30).

Regarding claim 3, the method of claim 2, further comprising: obtaining the utility function from a device selected from the group consisting of a network server and an end host (Colby: col. 4, lines 60-col. 5, line 3; server and end station).

Regarding claim 4, the method of claim 2, wherein the utility function is stored in the edge router (Colby: col. 6, lines 35-45; Figure 2).

Regarding claim 6, the method of claim 2, wherein the intra-flow priority is based on packet labeling (Colby: col. 11, lines 19-30; label is the content type determined).

Regarding claim 7, the method of claim 6, wherein the packet labeling corresponds to one or more layers of encoding (Colby: col. 6, lines 7-28; different transport levels; col. 9, lines 1-20; col. 10, lines 18-21).

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Regarding claim 8, the method of claim 7, wherein the encoding is selected from the group consisting of MPEG encoding (Colby: col. 10, lines 18-21) and RLM encoding (Colby: col. 9, Table 1 streaming video and audio for interactive).

Regarding claim 9, the method of claim 2, wherein the intra-flow priority is based on the content of a packet (Colby: col. 11, lines 19-30).

Regarding claim 10, the method of claim 9, wherein the content is selected from the group consisting of a TCP retry state, a control packet, and a data packet (Colby: col. 1, lines 37-47; payload).

Regarding claim 11, the method of claim 2, wherein the intra-flow priority is based on the reliability of the packet (Colby: col. 9, lines 1-12; QoS requirements).

Regarding claim 12, the method of claim 2, wherein the intra-flow priority is based on the sensitivity of the order of dropping packets in the flow (Colby: col. 9, lines 1-36; QoS requirements).

Regarding claim 13, the method of claim 2, further comprising: partitioning the utility function into a plurality of rate intervals (Colby: col. 6, lines 42-63; col. 8, lines 34-55; col. 9, lines 1-36; per unit of time).

Regarding claim 14, the method of claim 13, wherein each of the rate intervals represents a region of constant incremental utility (Colby: col. 9, lines 1-36; table 1; QoS class for streaming or interactivity).

Regarding claim 15, the method of claim 1, further comprising:

partitioning the flow into a plurality of rate intervals (Colby: col. 9, lines 1-20);
and

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determining the incremental utility based on the rate intervals (Colby: col. 9, lines 1-36; hot content, hit requests).

Regarding claim 16, the method of claim 15, wherein the step of partitioning includes:

estimating the rate of the flow (Colby: col. 6, lines 20-34); and
determining the number of packets per second that belong to each of the rate intervals based on at least one estimated rate and at least one packet size (Colby: col. 9, lines 1-36; content-size per unit of time).

Regarding claim 17, the method of claim 15, wherein the step of partitioning includes:

estimating the rate of the flow (Colby: col. 6, lines 20-34); and
determining the number of packets per second that belong to each of the rate intervals based on an epoch length and a packet size (Colby: col. 9, lines 1-36; content-size per unit of time).

Regarding claim 18, the method of claim 15, further comprising:

calculating the incremental utility corresponding to each of the rate intervals assigned to a packet and based on a utility function (Colby: col. 9, lines 1-36; content-size).

Regarding claim 19, the method of claim 1, wherein the label is proportional to the incremental utility (Colby: col. 6, lines 42-63; col. 8, lines 34-55; col. 9, lines 1-36).

Regarding claim 20, the method of claim 1, wherein the label is proportional to the incremental utility combined with a stability factor (Colby: col. 9, lines 1-36; QoS requirements).

Regarding claim 21, a network router (Colby: col. 4, lines 60 – col. 5, line 3), comprising:

means for receiving a plurality of packets (Colby: col. 4, lines 60 – col. 5, line 3);

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means for determining a flow corresponding to the plurality of packets (Colby: col. 5, lines 52-col. 6, line 6);

means for determining an incremental utility for each of the packets (Colby: col. 6, lines 42-63; col. 9, lines 1-20);

means for labeling each of the packets with a label as a function of the incremental utility (Colby: col. 6, lines 42-63; col. 8, lines 34-55; labeling by content records); and

means for processing each of the packets based on the label (Colby: col. 8, lines 34-55; passed to the server).

Regarding claim 22, the router of claim 21, wherein the means for determining the incremental utility includes:

means for obtaining a utility function corresponding to the flow (Colby: col. 6, lines 42-63; content rules);

means for determining an intra-flow priority corresponding to each of the packets (Colby: col. 11, lines 19-30); and

means for determining the incremental utility based on the utility function and the intra-flow priority (Colby: col. 6, lines 42-63; content rules; col. 11, lines 19-30).

Regarding claim 23, the router of claim 22, further comprising: means for partitioning the utility function into a plurality of rate intervals (Colby: col. 9, lines 1-36; per unit of time).

Regarding claim 24, the router of claim 22, further comprising: means for partitioning the utility function into a plurality of rate intervals (Colby: col. 9, lines 1-36; per unit of time).

Regarding claim 25, the router of claim 21, further comprising:

means for partitioning the flow into a plurality of rate intervals (Colby: col. 9, lines 1-36; per unit of time); and

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means for determining the incremental utility based on the rate intervals (Colby: col. 9, lines 1-36; calculate the throughput of all flows per unit of time).

Regarding claim 26, a computer-usable medium storing a computer program for directing a network router (Colby: col. 4; lines 60 – col. 5, line 3) to perform the steps of:

receiving a plurality of packets (Colby: col. 4, lines 60 – col. 5, line 3);

determining a flow corresponding to the plurality of packets (Colby: col. 5, lines 52-col. 6, line 6);

determining an incremental utility for each of the packets (Colby: col. 6, lines 42-63; col. 9, lines 1-20); and

labeling each of the packets with a label as a function of the incremental utility (Colby: col. 6, lines 42-63; col. 8, lines 34-55; labeling by content records).

Regarding claim 27, the computer-usable medium of claim 26, wherein the step of determining the incremental utility includes:

obtaining a utility function corresponding to the flow (Colby: col. 6, lines 42-63; content rules);

determining an intra-flow priority corresponding to each of the packets (Colby: col. 11, lines 19-30); and

determining the incremental utility based on the utility function and the intra-flow priority (Colby: col. 6, lines 42-63; content rules; col. 11, lines 19-30).

Regarding claim 28, the computer-usable medium of claim 27, further comprising: partitioning the utility function into a plurality of rate intervals (Colby: col. 9, lines 1-36; per unit of time).

Regarding claim 29, the computer-usable medium of claim 26, further comprising:

partitioning the flow into a plurality of rate intervals (Colby: col. 9, lines 1-36; per unit of time); and

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determining the incremental utility based on the rate intervals (Colby: col. 9, lines 1-36; calculate the throughput of all flows per unit of time).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 5 is rejected under 35 U.S.C. 103(a) as being anticipated by U.S. Patent No. 6,006,264 by Colby et al in view of U.S. Patent No. 5,933,425 by Iwata.

Regarding claim 5,

The Colby reference teaches the method of claim 2.

The Colby reference does not explicitly state sequential integers but does teach use of a hot count to traffic bursts requests.

The Iwata reference teaches calculating the utility function based on a rule corresponding to one or more incremental utilities that are sequential integers (Iwata: col. 4, lines 44-67).

The Iwata reference further teaches the invention selects an optimal path in real time meeting the QoS parameter requirements (Iwata: col. 4, lines 30-54).

Therefore it would have been obvious at the time of the invention to one of ordinary skill in the art to create the method of operating an edge router as taught by Colby while employing sequential integers as taught by Iwata in order to select an optimal path in real time meeting the QoS parameter requirements (Iwata: col. 4, lines 30-54).

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Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Benjamin R Bruckart whose telephone number is 571-272-3982. The examiner can normally be reached on 8:00-5:30 PM with every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hosain Alam can be reached on 571-272-3978. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306 for regular communications and After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 571-272-3982.

Benjamin R Bruckart
Examiner
Art Unit 2155
brb
October 28, 2004

brb

Hosain Alam
HOSAIN ALAM
SUPERVISORY PATENT EXAMINER